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1: J Biol Chem. 1993 Dec 15;268(35):26712-8.

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L-29, a soluble lactose-binding lectin, is phosphorylated on serine 6 and serine 12 in vivo and by casein kinase I.

Huflejt ME, Turck CW, Lindstedt R, Barondes SH, Leffler H.

Department of Psychiatry, University of California, San Francisco 94143.

L-29, a mammalian soluble lactose-binding lectin, was previously shown to be phosphorylated in confluent 3T3 fibroblasts (Cowles, E. A., Agrwal, N., Anderson, R. L., and Wang, J. L. (1990) J. Biol. Chem. 265, 17706-17712), which contain a small amount of this protein. We have determined the site of phosphorylation on L-29, taking advantage of the abundance of L-29 (about 1% of total soluble cell protein) in confluent polarized Madin-Darby canine kidney (MDCK) cells. Approximately 15-20% of the L-29 is phosphorylated in these cells. Phosphoamino acid analysis showed phosphate incorporation only at serine. Analysis of chymotryptic and endoproteinase Asp-N-generated NH2-terminal fragments by Edman degradation showed that 90% of the phosphate was at Ser6 and 10% at Ser12. The sequence surrounding Ser6, which is conserved in all known L-29 sequences, indicated that this serine might be phosphorylated by casein kinase I or casein kinase II. Reaction of human recombinant L-29 with [gamma-32P]ATP and each of these casein kinases showed that only casein kinase I catalyzed significant incorporation of 32P into L-29; and, as with the L-29 from the MDCK cell extracts, most of the phosphate was incorporated at Ser6 and a small amount was incorporated at Ser12.

PMID: 8253806 [PubMed - indexed for MEDLINE]

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1: Cancer Res. 1991 Apr 15;51(8):2173-8. Related Articles, Links

Molecular cloning and chromosomal mapping of a human galactoside-binding protein.

Raz A, Carmi P, Raz T, Hogan V, Mohamed A, Wolman SR.

Cancer Metastasis Program, Michigan Cancer Foundation, Detroit 48201.

A human galactoside-binding protein with an Mr of 31,000 was cloned from the human HT-1080 fibrosarcoma complementary DNA library. A partial complementary DNA clone containing the complete coding region was characterized and the deduced sequence encodes a polypeptide of 242 amino acids with the characteristics of a carbohydrate-binding protein. The gene coding for the human galactoside-binding protein was mapped to the chromosomal band 1p13. The deduced amino acid sequence of the human galactoside-binding protein revealed 95 residues at the amino terminus, homologous to the predicted amino acid sequence of the second exon of the human L-myc gene.

PMID: 2009535 [PubMed - indexed for MEDLINE]

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1: Proc Natl Acad Sci U S A. 1990 Sep;87(18):7324-8.

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Molecular cloning of a human macrophage lectin specific for galactose.

Cherayil BJ, Chaitovitz S, Wong C, Pillai S.

Molecular Immunology Laboratory, Massachusetts General Hospital, Boston.

The murine Mac-2 protein is a galactose- and IgE-binding lectin secreted by inflammatory macrophages. We describe here the cloning and characterization of a cDNA representing the human homolog of Mac-2 (hMac-2). The amino acid sequence derived from the hMac-2 cDNA indicates that the protein is evolutionarily highly conserved, with 85% of its amino acid residues being similar to those in the murine homolog. This conservation is especially marked in the carboxyl-terminal lectin domain. The amino-terminal half of the protein is less conserved but still contains the repetitive proline-glycine-rich motif seen in the mouse protein. hMac-2 synthesized in vitro is recognized by the M3/38 monoclonal antibody to Mac-2 and binds to the desialylated glycoprotein asialofetuin and to laminin, a major component of basement membranes. These findings are discussed in the context of the potential functions of hMac-2.

PMID: 2402511 [PubMed - indexed for MEDLINE]

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Molecular Immunology Laboratory, Massachusetts General Hospital, Boston.

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1: Biochemistry. 1990 Sep 4;29(35):8093-100.

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Human IgE-binding protein: a soluble lectin exhibiting a highly conserved interspecies sequence and differential recognition of IgE glycoforms.

Robertson MW, Albrandt K, Keller D, Liu FT.

Medical Biology Institute, Division of Molecular Biology, La Jolla, California 92037.

IgE-binding protein (epsilon BP) refers to a protein originally identified in rat basophilic leukemia cells by virtue of its affinity for IgE. It is now known to be a beta-galactoside-binding lectin equivalent to carbohydrate-binding protein 35 (CBP 35). More recently, its identity to Mac-2, a macrophage cell-surface protein, has been established. cDNA coding for human epsilon BP has been cloned from a human HeLa cell cDNA library and contains an open reading frame of 750 base pairs encoding a 250 amino acid protein. Like the rat and murine counterparts, the human epsilon BP amino acid sequence can be divided into two domains with the amino-terminal domain consisting of a highly conserved repetitive sequence (YPGXXXPGA) and the carboxyl-terminal domain containing sequences shared by other S-type lectins. The human epsilon BP sequence exhibits extensive homology to murine and rat epsilon BP with 84% and 82% identity, respectively. The homology is particularly striking in the carboxyl-terminal domain where 95% identity is found between human and murine sequences in a stretch of over 70 amino acids. A survey of epsilon BP mRNA expression from several lymphocyte cell lines revealed that the level of epsilon BP transcription may reflect a relationship between cell differentiation and epsilon BP expression. Finally, human epsilon BP was purified from several human cell lines and shown to possess lactose-binding characteristics and cross-species reactivity to murine IgE. Surprisingly, three different human myeloma IgE proteins did not show reactivity to human epsilon BP. However, after neuraminidase treatment of each human IgE, pronounced binding to epsilon BP was observed, thereby indicating that only specific IgE glycoforms can be recognized by epsilon BP.

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1: Gene. 1991 Mar 15;99(2):279-83.

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Human breast carcinoma cDNA encoding a galactoside-binding lectin homologous to mouse Mac-2 antigen.

Oda Y, Leffler H, Sakakura Y, Kasai K, Barondes SH.

Department of Psychiatry, Langley Porter Psychiatric Institute, University of California, San Francisco 94143-0984.

A galactoside-binding lectin (Mr 29,000) has previously been identified in rat, mouse and human tissues. It is an abundant cell-surface component of inflammatory macrophages and their major non-integrin laminin-binding protein. It has also been found in the nucleus of other cell types. Here, we report the cloning and sequencing of a cDNA encoding the human galactoside-binding lectin from a breast carcinoma. The clone encodes a protein of 250 amino acids (aa) that is over 80% identical to its mouse and rat counterparts. The aa sequence has an N-terminal and a C-terminal, 'carbohydrate-binding', domain. The N-terminal domain consists of two parts. The first 41 aa are homologous to a transcription factor, i.e., the serum response factor. The adjacent part (aa 42-106) contains an unusual repeating element, that occurs seven times in human protein compared to nine times in rat and mouse. The C-terminal 'carbohydrate-binding' domain (aa 115-250) shows homology to L-14, another galactoside-binding lectin.

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